

Claims.

1. A jet spouted fluidised bed drier for the drying of a slurry of biomaterials including in combination:

- a hot gas inlet means constructed and arranged to allow the passage of hot high velocity gas into the bottom of the chamber in a substantially upward vertical direction;

- a first lower conical member in which the cone axis is substantially vertical having its lower narrow end connected to the hot gas inlet and having an upper wide end and a first internal cone angle;

- a first lower screen located in the first conical member adjacent its connection with the hot gas inlet means;

- a second upper conical member in which the cone axis is substantially vertical and coaxial with the cone axis of the first conical member having its lower wide end connected to the upper wide end of the first conical member and having an upper narrow end and a second internal cone angle;

- a hot gas outlet means connected to the upper narrow end of the second conical member constructed and arranged to allow the passage of hot high velocity gas from the upper narrow end of the second conical chamber in a substantially upward vertical direction;

- a second upper conical screen having a cone axis, an upper wide end, a lower closed end and a third internal cone angle;

- a suitable quantity of inert carrier particles contained within the first and second conical members; and

- at least one inlet port for the slurry of biomaterials constructed and arranged to provide an atomised flow of the slurry into the chamber;

wherein:

- (a) the first lower screen is constructed and arranged to

prevent the inert carrier particles from escaping into the hot gas inlet means;

(b) the second upper conical screen has its cone axis coaxial with the cone axis of the second upper conical member;

(c) the second upper conical screen is connected to the second upper conical member adjacent to and surrounding the hot gas exit means; and

(d) the second upper conical screen is constructed and arranged to prevent the inert carrier particles from escaping into the hot gas outlet means.

2. A jet spouted fluidised bed drier for the drying of a slurry of biomaterials including in combination:

- a hot gas inlet means constructed and arranged to allow the passage of hot high velocity gas into the bottom of the chamber in a substantially upward vertical direction;

- a first lower conical member in which the cone axis is substantially vertical having its lower narrow end connected to the hot gas inlet and having an upper wide end and a first internal cone angle;

- a first lower screen located in the first conical member adjacent its connection with the hot gas inlet means;

- a cylindrical member in which the cylinder axis is substantially coaxial with the cone axis of the first conical member having its lower end connected to the upper end of the first conical member and having an upper end;

- a second upper conical member in which the cone axis is substantially vertical and coaxial with the cylinder axis of the cylindrical member having its lower wide end connected to the upper end of the cylindrical member and having an upper narrow end and a second internal cone angle;

- a hot gas outlet means connected to the upper narrow end of the second conical member constructed and arranged to

allow the passage of hot high velocity gas from the upper narrow end of the second conical chamber in a substantially upward vertical direction;

- a second upper conical screen having a cone axis, an upper wide end, a lower closed end and a third internal cone angle;

- a suitable quantity of inert carrier particles contained within the first and second conical members; and

- at least one inlet port for the slurry of biomaterials constructed and arranged to provide an atomised flow of the slurry into the chamber;

wherein:

- (a) the first lower screen is constructed and arranged to prevent the inert carrier particles from escaping into the hot gas inlet means;

- (b) the second upper conical screen has its cone axis coaxial with the cone axis of the second upper conical member;

- (c) the second upper conical screen is connected to the second upper conical member adjacent to and surrounding the hot gas exit means; and

- (d) the second upper conical screen is constructed and arranged to prevent the inert carrier particles from escaping into the hot gas outlet means.

3. A drier according to Claims 1 or 2 wherein the first and the second internal cone angles are the same.

4. A drier according to Claims 1 or 2 wherein the first and the second cone angles are each from about 30° to about 45°.

5. A drier according to Claims 1 or 2 wherein the first and the second cone angles are each about 40°.

6. A drier according to Claims 1 or 2 wherein the third cone angle is from about 30° to about 45°.
7. A drier according to Claims 1 or 2 wherein the third cone angle is about 40°.
8. A drier according to Claims 1 or 2 wherein the inert carrier particles are fabricated from a material chosen from the group consisting of glass, polymer resin, polypropylene, PVC, silica gel and polytetrafluoroethylene.
9. A drier according to Claims 1 or 2 wherein the inert carrier particles are fabricated from polytetrafluoroethylene.
10. A drier according to Claims 1 or 2 wherein the inert carrier particles are fabricated as spheres or cubes.
11. A drier according to Claims 1 or 2 wherein the inert carrier particles are fabricated as spheres.
12. A drier according to Claims 1 or 2 wherein the inert carrier particles are fabricated as polytetrafluoroethylene cubes.